

**METHOD AND CIRCUIT FOR MULTIPLYING SIGNALS WITH A TRANSISTOR
HAVING MORE THAN ONE INDEPENDENT GATE STRUCTURE**

ABSTRACT OF THE DISCLOSURE

5

A double gate semiconductor device (2006) is used beneficially as a multiplier (2000). The double gate semiconductor device (2006) has a lateral fin (105) as the channel region with the gates formed opposite each other on both sides of the fin. The lateral positioning of the fin provides symmetry between the two gates. To increase drive current, multiple transistors are
10 easily connected in parallel by having a continuous fin structure (2106) with alternating source/drain terminals (2120, 2122, 2124, 2126) in which the sources are connected together and the drains are connected together. Gates (2116, 2110) are positioned between each pair of adjacent source/drain terminals and electrically connected together. The multiplier (2000) may also be used as a mixer and further as a phase detector.